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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/812,027 | 03/19/2001 | Bharat Shivkumar | IR-1881 | 4072 |

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OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER

MITCHELL, JAMES M

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2827

DATE MAILED: 03/28/2002

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/812,027

Applicant(s)

SHIVKUMAR ET AL.

Examiner

James Mitchell

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to the amendment filed March 19, 2001.

Specification

2. The disclosure is objected to because of the following informalities: In claim 4, line 4 there appears to be a typographical error with the word "furst".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 6-10, 12-13, 18 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claims 6-10 recites the limitation "the free surface" in line 2, and claim 12 recite "said insulation cup". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Wojnarowski et al. (U.S 5,866,952).

Art Unit: 2827

8. Wojnarowski discloses a MCM device comprising a flat thin insulation substrate (Column 5, Lines 33-35, Item 10) having parallel top and bottom surfaces with a plurality of laterally displaced vias (Fig. 1(e), "30a") extending between said surfaces; a semiconductor flip chip (Column 4, Lines 25-27) having a top and bottom surface with a first and second electrode on top (a conductive mold portion on the die) and a first and second electrode connected to a bottom of die that is connected to a via (shown in Fig. 1(e)), a second flip chip (14) having a top and bottom surface and a first and second electrode (15) being connected to a respective via (shown in Fig. 1(e)) with either an insulating or conductive mold material (Column 7, Lines 39-40 and 55) extending over the top of the substrate and upper most surface of the die and connected to one of said vias (through a connection with said chip); said device including a passive component (20) which has at least one dimension longer than another of its dimensions (via component's height versus width), said component being connected to a via (Fig. 1 (e)) and mounted on a first surface of said substrate with at least one dimension disposed perpendicular (via component's height) to said first surface of said substrate.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wojnarowski.

11. Wojnarowski disclose the elements stated in paragraph 9, but do not show the insulation cap ("insulating mold") with a plurality of spaced fins extending from a free surface (presumed to mean an open area).

12. However, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose these particular dimensions because applicant has not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

13. With respect to claim 10, to move the passive component between a pair of respective fins would have been obvious, since it has been held that a rearrangement of parts involves only routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950)

14. Claim 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wojnarowski in view of Akram et al. (U.S 2001/0015492).

Art Unit: 2827

15. Wojnarski discloses the elements stated in paragraph 9, but does not disclose that in the alternative that the conductive electrode ("metal mold") has a plurality of grooves which define fins in the upper surface of the conductive electrode.

16. Akram utilizes a conductive material ("electrode" with fins (Fig.3).

17. It would have been obvious to one of ordinary skill in the art to incorporate fins in the conductive electrode of Wojnarowski in order provide heat dissipation for the chip as taught by Akram (Paragraph 0010 Lines 3-4).

18. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wojnarowski in view of Hoang (U.S 6,201,301).

19. Wojnarowski does not explicitly disclose that solder balls are being used to accompany the interconnect structure, however Hoang utilizes solder balls for an interconnection of the chip package (Fig. 3).

20. It would have been obvious to one of ordinary skill in the art to form solder balls on the bottom of the substrate at respective vias of Wojnarowski in order to provide electrical connection to the chip as taught by Hoang (Column 2, Lines 5-6).

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Auyeung (EP 05278411), and Tuttle (U.S 5,907,477).

The prior art discloses in Auyeung the use of fins formed in a cap for heat dissipation, and in Tuttle the use of dam to provide for separate circuit.

Art Unit: 2827

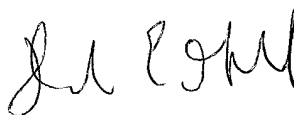
Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Mitchell whose telephone number is (703) 305-0244. The examiner can normally be reached on M-F 10:30-8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3230 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



jmm
March 23, 2002



DAVID E. GRAYBILL
PRIMARY EXAMINER